

Attorney's Docket No. 67,200-262

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Hsu  
Serial No.: 09/ 588,788  
Filed: June 6, 2000  
For: Planar Spiral Inductor Structure Having Enhanced Q Value

Group Art Unit: 3729  
Examiner: Anthony D. Tugbang

Commissioner for Patents  
Alexandria, VA 22313

TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION-37 CFR 192)

1. Transmitted herewith, in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on Jan. 20, 2004.

NOTE: "The Appellant shall, within 2 months from the date of the notice of appeal under §1.191(a) or within the time allowed for response to the action appealed from, if such time is later, file a brief in "triplicate", 37 C.F.R. 1.192(a) [emphasis added].

2. STATUS OF APPLICANT

This application is on behalf of:

X other than a small entity.  
\_\_\_ a small entity.

A verified statement:

\_\_\_ is attached.  
\_\_\_ was already filed.

3. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 CFR 1.17(f), the fee for filing the Appeal Brief is:

\_\_\_ small entity \$165.00  
X other than a small entity \$330.00

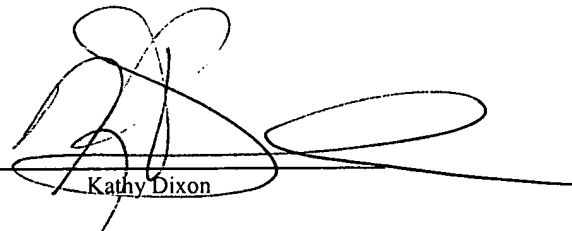
Appeal Brief fee due: \$ 330.00

Certificate of Mailing/Transmission (37 CFR 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being:

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for Patents, Alexandria, VA 22313

  
Kathy Dixon

Dated: 3/16, 2004

3-18-04  
CC/AFI/3729

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4. EXTENSION OF TERM

NOTE: The time periods set forth in 37 CFR 1.192(a) are subject to the provision of ☐ 1.136 for patent applications. 37 CFR 1.191(d). See also Notice of November 5, 1985 (1060 O.G. 27).

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply:

(complete (a) or (b), as applicable)

- (a) ☐ Applicant petitions for an extension of time under 37 CFR 1.136  
(fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

	Extension (months)	Fee for other than <u>small entity</u>	Fee for <u>small entity</u>
<input type="checkbox"/>	one month	\$ 110.00	\$ 55.00
<input type="checkbox"/>	two months	\$ 420.00	\$210.00
<input type="checkbox"/>	three months	\$ 950.00	\$475.00
<input type="checkbox"/>	four months	\$1,480.00	\$740.00

Fee: \$ \_\_\_\_\_

If an additional extension of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

- ☐ An extension for \_\_\_\_\_ months has already been secured, and the fee paid therefor of \$ \_\_\_\_\_ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request: \$ \_\_\_\_\_

or

- (b) ☐ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. TOTAL FEE DUE

The total fee due is:

Appeal Brief Fee: \$ 330.00  
Extension fee (if any) \$ \_\_\_\_\_

TOTAL FEE DUE: \$ 330.00

6. FEE PAYMENT

X Attached is a Credit Card Payment Form for the sum of \$ 330.00

A duplicate copy of this transmittal is attached.

7. FEE DEFICIENCY

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, 1065 O.G. 31-33.

  X   If any additional extension and/or fee is required, this is a request therefor  
to charge Visa Credit Card No. 4756 8461 9568 0263

And/Or

  X   If any additional fee for claims is required, please charge Visa Credit Card  
No. 4756 8461 9568 0263



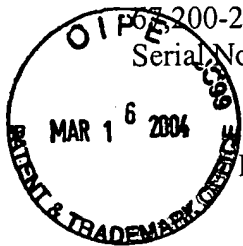
\_\_\_\_\_  
Signature of Attorney

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Serial No. 09/588,788

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

**APPEAL BRIEF**

**TO:** Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**FROM:** Tung & Associates  
838 West Long Lake Road - Suite 120  
Bloomfield Hills, MI 48302

**DATE:** 5 February 2003

**REF:** Appellant : Hsu et al Filing Date : 6 June 2000  
Serial No.. : 09/588,788 Att'y No. : 67,200-262; TSMC 99-545  
Art Unit : 3729 Examiner : Anthony D. Tugbang  
Title : Planar Spiral Inductor Structure Having Enhanced Q Value

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**EXPRESS MAIL CERTIFICATE**

Express Mail label Number EV 353 257 704 US  
Date of Deposit Mar. 16/04

I hereby certify that this paper in triplicate and a credit card payment form in the amount of \$330.00 (required filing fee) are being deposited with the United States Postal Service via Express Mail on the date indicated above and is addressed to: Commissioner for Patents, Alexandria, VA 22313-1450

Kathy Dixon

**APPEAL BRIEF**

Sir:

In response to rejection of the claims in the above referenced application for United States Patent in an office action mailed 31 December 2003 and made FINAL, appellant filed a notice of appeal on 20 January 2003. In accord with appellant's notice of appeal, please accept this appeal brief. No oral argument is requested.

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1. Real Party in Interest

The real party in interest for this application is the assignee:

Taiwan Semiconductor Manufacturing Co., Ltd.  
121 Park Avenue, No. 3  
Science Based Industrial Park  
Hsin-Chu, Taiwan, Republic of China

An assignment has been recorded for this United States Patent application.

2. Related Appeals and Interferences

There are no related appeals or interferences for this United States Patent application.

3. Status of the Claims

Claims 1-2, 4-8 and 16 are pending in this application. Claims 9-15 have been canceled incident to a restriction requirement. Claims 1-2, 4-6, 8 and 16 are finally rejected under 35 U.S.C. § 102(b). Claim 7 is finally rejected under 35 U.S.C. § 103(a). No claims are allowed or objected to. Claim 2 is withdrawn herein.

Appellant takes appeal for claims 1, 4-8 and 16. Appeal is not taken for claim 2. Claim 2 is withdrawn herein in accord with MPEP 1207.

4. Status of the Amendments

An amendment and response, filed 19 December 2003, was submitted in response to the office action made FINAL, in order to overcome the Examiner's rejections of the claims pending within this application. In an advisory action mailed on 7 January 2004, the Examiner indicated that appellant's response was considered but did not place appellant's application in

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condition for allowance. Appellant's proposed amendments were not entered since they: (1) raised new issues; and (2) did not materially reduce or simplify the issues for appeal.

Appellant files a supplemental amendment and response with this appeal brief in accord with MPEP 1207. The amendment cancels claim 2 (which applicant withdraws herein) and amends claim 1 to address the Examiner's claim objection within the office action made FINAL. Appellant does not believe that the foregoing amendments raise new issues or otherwise preclude entry under 37 C.F.R. 1.116.

#### 5. Summary of the Invention

The invention provides a method for fabricating a microelectronic inductor structure within a microelectronic fabrication, as well as the microelectronic inductor structure fabricated within the microelectronic fabrication while employing the method. The microelectronic inductor structure is fabricated with optimal properties, as characterized by an enhanced Q value of the microelectronic inductor structure. (page 6, first paragraph)

The present invention realizes the foregoing object by employing when fabricating a planar spiral inductor structure in accord with the present invention a spirally patterned conductor layer for forming the planar spiral inductor. A successive series of spirals within the spirally patterned conductor layer is formed with a variation in at least one of: (1) a series of linewidths of the successive series of spirals; and (2) a series of spacings separating the successive series of spirals. (page 6, first paragraph)

The invention is claimed in three levels of scope that provide three separate methods for fabricating an inductor structure, including: (1) independent method claim 1 and

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dependent limitations thereupon (claims 5-8 and 16); (2) independent method claim 2; and (3) independent method claim 4.

Independent claim 1 is read on the specification and drawings as follows:

1. (amended) A method for fabricating an inductor structure comprising:

providing a substrate 10; (Fig. 1, Fig. 2; page 9, second full paragraph and page 12, second full paragraph)

forming over the substrate 10 a single spiral planar spiral conductor layer 12 to form a single spiral planar spiral inductor, wherein a successive series of spirals 12a/12b/12c/12d/12d'/12c'/12b'/12a' within the single spiral planar spiral conductor layer 12 is formed with a continuous variation in at least one of:

a series of linewidths LW1/LW2/LW3/LW4 of the successive series of spirals;

and

a series of spacings separating the successive series of spirals. (Fig. 1; Fig. 2; page 9, second full paragraph to page 11, first partial paragraph; page 12, second full paragraph)

## 6. Issues

Claims rejection issues from the office action made FINAL include:

I. Whether claims 1-2, 4-6, 8 and 16 may properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Romankiw et al. (U.S. Patent No. 4,295,173; hereinafter "Roamnkiv").

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II. Whether claim 2 may properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Woolnik (U.S. Patent No. 4,187,485).

III. Whether claim 7 may properly be rejected under 35 U.S.C. § 102(b) as being unpatentable over Romankiw in view of Ohmura et al. (U.S. Patent No. 4,392,013).

Appellant does not wish to pursue appeal of claim 2 in light of the Woolnik disclosure and the Examiner's analysis thereof. Applicant withdraws claim 2 in accord with MPEP 1207. Thus, the foregoing issues are reduced and restated as follows.

I. Whether claims 1, 4-6, 8 and 16 may properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Romankiw.

II. Whether claim 7 may properly be rejected under 35 U.S.C. § 102(b) as being unpatentable over Romankiw in view of Ohmura.

#### 7. Grouping of Claims

Claims 1, 5-8 and 16 are directed towards a first claimed embodiment of the invention.

Claim 2 is directed towards a second claimed embodiment of the invention for which appeal is not taken.

Claim 4 is directed towards a third claimed embodiment of the invention.



The claims stand or fall together within their respective groups.

8. Argument

I. Claims 1, 4-6, 8 and 16 may not properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Romankiw.

a. Romankiw Subject Matter

Romankiw at Fig. 1B teaches a planar spiral inductor structure comprising a series of spirals apparently having a narrower linewidth closer to a medium M than further removed from the medium M.

b. The Examiner's Assertions

At page 2, next to last paragraph of the office action made FINAL, the Examiner asserts that Romankiw at Fig. 1B teaches a single spiral planar spiral conductor layer 10a/b/c/d/e/f/g/h that forms a single spiral planar inductor, wherein a series of successive spirals formed within the planar spiral conductor layer 10a/b/c/d/e/f/g/h is formed with a continuous variation of a series of linewidths of the successive series of spirals, in accord with appellant's claim 1 and claim 4, clauses 3.

c. Appellant's Response

In response, appellant asserts that Romankiw's planar spiral conductor layer 10a-10h as illustrated in Fig. 1B is not formed with a continuous variation of a series of linewidths of a successive series of spirals therein in accord with appellant's claims 1 and 4, clauses 3. Rather, Romankiw's planar spiral conductor layer 10a-10h comprises a successive series of spirals apparently having within each spiral within the successive series a uniformly wider linewidth for

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a subgroup of spiral portions further removed from a medium M and a uniformly narrower linewidth for a subgroup of spiral portions closer to the medium M.

Thus, since each and every limitation within appellant's invention as disclosed and claimed within claims 1 and 4 is not disclosed within Romankiw with respect to a planar spiral conductor layer formed with a continuous variation of a series of linewidths of a successive series of spirals therein, appellant asserts that claims 1 and 4 may not properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Romankiw. Since all remaining claims within the foregoing rejections are dependent upon claim 1 and carry all of the limitations of claim 1, appellant additionally asserts that those remaining claims may also not properly be rejected under 35 U.S.C. § 102(b) as being anticipated by Romankiw.

As an additional and independent basis for patentability of claim 1, appellant notes that Romankiw at Fig. 1B teaches a pair of planar spiral conductor layers 10a/c/e/g and 10b/d/f/h rather than a planar spiral conductor layer formed as a single spiral in accord with claim 1, clause 2.

In light of the foregoing responses, appellant respectfully requests that the Examiner's rejections of claims 1, 4-6, 8 and 16 under 35 U.S.C. § 102(b) as being anticipated by Romankiw be reversed.

II. Claim 7 may not properly be rejected under 35 U.S.C. § 102(b) as being unpatentable over Romankiw in view of Ohmura.

a. Ohmura Subject Matter

Ohmura (abstract) teaches a fine patterning of a thick film conductor layer.

b. The Examiner's Assertions

At page 4, paragraph 2 of the office action made FINAL, the Examiner cites Ohmura as teaching linewidths of spiral conductors in a range of 7-10 microns or 34.9-190 microns. Such linewidths are needed to properly reject appellant's claim 7, but not otherwise taught within Romankiw.

The Examiner rationalizes suggestion or motivation for modification or combination of Romankiw with Ohmura such as "to positively form spiral conductors free from short circuiting and with high reliability."

c. Appellant's Response

In response, appellant notes that the foregoing ranges that the Examiner cites as linewidths for patterned conductor layers, Ohmura in fact actually teaches (abstract) as thicknesses of patterned conductor layers. Thus, Ohmura does not lend to Romankiw that which is absent within Romankiw and needed to reject appellant's claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Romankiw in view of Ohmura. For this reason, appellant asserts that claim 7 may not properly be rejected under 35 U.S.C. § 103(a) as being unpatentable over Romankiw in view of Ohmura.

As a separate basis of patentability of claim 7, appellant predicates patentability of claim 7 upon claim 1.

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In light of the foregoing responses, appellant respectfully requests that the Examiner's rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Romankiw in view of Ohmura be reversed.

9. Summary

Appellant's invention as disclosed and claimed within claim 1 and claim 4 is directed towards a method for fabricating an inductor structure. The method employs a planar spiral conductor layer to form a planar spiral inductor, wherein a successive series of spirals within the planar spiral conductor layer is formed with a continuous variation in at least one of: (1) a series of linewidths of the successive series of spirals; and (2) a series of spacings separating the successive series of spirals. Absent from the prior art of record employed in rejecting appellant's claims to appellant's invention is a disclosure of each and every limitation within appellant's claimed invention.

10. Conclusion

Appellant requests that the Board of Patent Appeals and Interferences reverse the Examiner's action in rejecting the claims within this application within the office action made FINAL. Allowance of all claims remaining within this application, in accord with the appended copy of the claims, is respectfully requested.

Respectfully submitted,  
  
Randy W. Tung (Reg. No. 31,311)

**APPENDIX**  
**COMPLETE COPY OF THE CLAIMS**

1. (previously presented) A method for fabricating an inductor structure comprising:
  - providing a substrate;
  - forming over the substrate a single spiral planar spiral conductor layer to form a single spiral planar spiral inductor, wherein a successive series of spirals within the single spiral planar spiral conductor layer is formed with a continuous variation in at least one of:
    - a series of linewidths of the successive series of spirals; and
    - a series of spacings separating the successive series of spirals.
2. (withdrawn) A method for fabricating an inductor structure comprising:
  - providing a substrate;
  - forming over the substrate a planar spiral conductor layer to form a planar spiral inductor, wherein a successive series of spirals within the planar spiral conductor layer is formed with a continuous variation in at least one of:
    - a series of linewidths of the successive series of spirals; and
    - a series of spacings separating the successive series of spirals, wherein by employing within the successive series of spirals within the planar spiral conductor layer the variation in at least one of the series of linewidths of the successive series of spirals and the series of spacings separating the successive series of spirals, the planar spiral inductor is fabricated with an enhanced Q value.
3. (canceled)

4. (previously presented) A method for fabricating an inductor structure comprising:

providing a substrate;

forming over the substrate a planar spiral conductor layer to form a planar spiral inductor, wherein a successive series of spirals within the planar spiral conductor layer is formed with a continuous variation in at least one of:

a series of linewidths of the successive series of spirals; and

a series of spacings separating the successive series of spirals, wherein the successive series of spirals is formed in a shape selected from the group consisting of a triangle, a square, a rectangle, a higher order polygon, a uniform ellipse and a circle.

5. (original) The method of claim 1 wherein the planar spiral conductor layer is formed of a conductor material selected from the group consisting of non-magnetic metal, non-magnetic metal alloy, magnetic metal, magnetic metal alloy, doped polysilicon and polycide conductor materials, and laminates thereof.

6. (original) The method of claim 1 wherein the variation in the series of linewidths of the successive series of spirals is an increasing progression of linewidth from a first spiral which defines the center of the planar spiral inductor having a comparatively narrow linewidth to a final spiral which defines the perimeter of the planar spiral inductor having a comparatively wide linewidth.

7. (original) The method of claim 6 wherein the comparatively narrow linewidth is from about 7 to about 10 microns and the comparatively wide line width is from about 17 to about 21 microns.

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8. (original) The method of claim 1 wherein the successive series of spirals comprises from about 1 to about 8 spirals.

9. - 15. (canceled)

16. (previously presented) The method of claim 1 wherein the continuous variation is a progressively increasing or decreasing continuous variation.